Soltex Inhibit® Antioxidant Blend

Product Specifications and Application Guide

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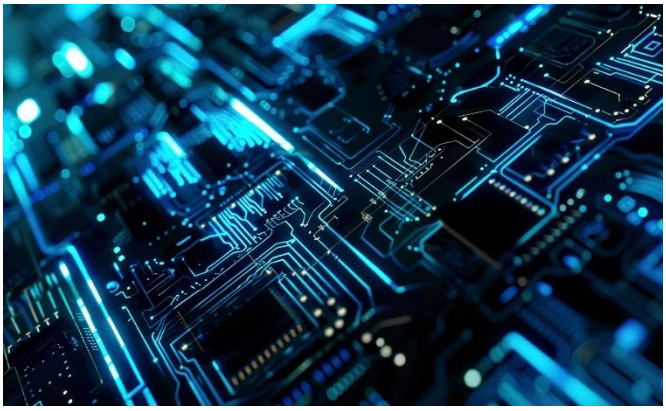
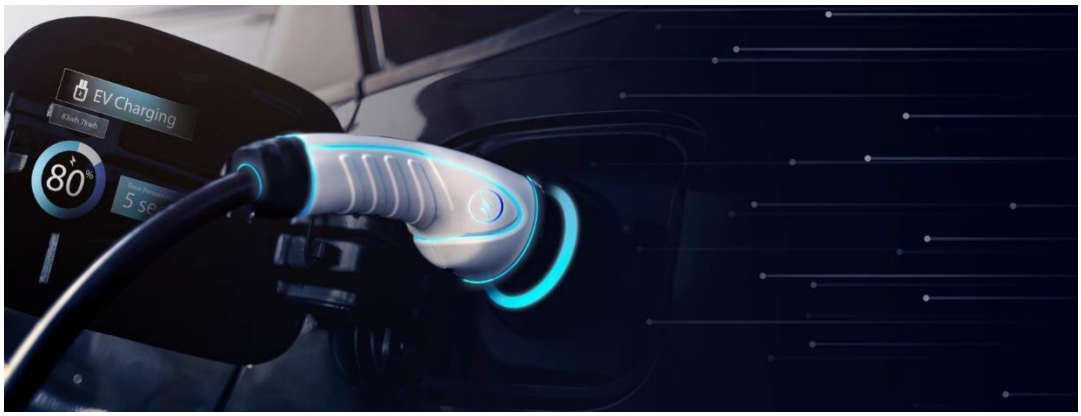
Soltex – An Introduction

Soltex, Inc. makes oils and additives for cooling electrical circuits. Our oils are used in many industries to provide cooling and electrical insulation solutions.

Our oils cool power-dense electronic circuits and high torque DC automotive motors. We help companies make better and safer electric batteries. Soltex's oils lower the operating costs of power transformers and protect them against fire and explosion. Our oils cool military and aerospace computers, F1 auto motors, robots, and underwater vehicles. Our highly biodegradable oils can be used in environmentally sensitive applications.



You will find Soltex wherever electrical circuits are cooled.



A Partial List of Soltex Products

Alpha-1 Fluid	Synthetic hydrocarbon fire resistant oil for retrofilling existing equipment originally filled with conventional transformer oil or PCB fluids.
Beta Fluid	Low Cost Fire resistant insulating oil for new transformers and switchgear.
OptiCool Fluid	Advanced dielectric cooling oils for electronics application
OptiCool 87252 Fluid	Synthetic dielectric heat transfer fluid for extremely low temperatures found in military and aerospace applications Meets requirements of MIL-87252C.
Alpha-2 Fluid	Specialty low temperature insulating and ceramic poling oil Pours down to –70 degrees.
Silicone Fluid	DC 561 ® electrical grade silicone fluid from Dow Corning Corporation.
Soltex Inhibit	Concentrated antioxidant blend for field application in transformers.
Soltex Sulfur Inhibitor®	The solution to corrosive sulfur problems. The only product on the market that changes corrosive sulfur (DBDS) to noncorrosive types.

Soltex Inhibit:
Concentrated Antioxidant Additive for Insulating Oil

Soltex Inhibit is a concentrated blend of advanced antioxidant that is used to treat transformer oil with depleted oxidation inhibitors. Due to its convenient liquid form, Inhibit requires no premixing, instead can be added directly into a de- energized transformer.

Manufactured with the highest quality petroleum oils and advanced antioxidants, Soltex Inhibit slows transformer oil from aging prematurely, thus inhibiting the formation of byproducts such as sludge and acids. When used at the proper treat rate, Soltex Inhibit will bring oxidation inhibitors to 0.3% by weight.

Use Soltex Inhibit in any application for transformer oil. Soltex Inhibit can be added to new transformer oil, reconditioned oil, or oil that has simply used up its oxidation inhibitor content. Soltex Inhibit can be used with conventional transformer oil- or fire-resistant hydrocarbon fluids, such as Beta Fluid, Alpha-1 Fluid, R-temp, or vegetable oils.

- Pour directly into oil, no mixing required.
- Made for easy field application.
- Restores inhibitor levels to original specs.

Applications:
Use Soltex Inhibit in any application for transformer oil. Soltex Inhibit can be used with conventional transformer oil or fire resistant hydrocarbon fluids, such as Beta Fluid. Use Soltex Inhibit at the treatment rate of 1:40 (five gallons of Soltex Inhibit will treat 200 gallons of transformer oil)

Typical Properties:

Appearance	Yellow liquid
Fire Point, D92, ^{o}C.	308
Viscosity, D88, cSt. @ 100 ^{o}C	11.4
Density @ 20 ^{o}C, g/cc	0.86
Pour Point, D97, ^{o}C.	-21
Dielectric Breakdown, D1816, kV	56

RECEIPT AND HANDLING OF SOLTEX INHIBIT

Soltex Inhibit is a viscous yellow fluid – a blend of petroleum oil with powerful antioxidants.

Shipping Containers

Soltex's fluids are available in five-gallon containers, 55-gallon drums, 330 gallon "tote" containers, or tank trailers. Each type of shipping container should be handled according to standard industry practice in order to ensure that the fluid will retain its original characteristics.

All containers should be examined for mechanical integrity when they are accepted – there should be no leaks, punctures, or loose caps or seals. If any of these are noticed when the product arrives, the customer should refuse delivery of the product and contact Soltex immediately.

Receipt and Inspection of Shipments

The receipt and inspection of Soltex Inhibit Antioxidant Blend should follow similar procedures to those used for conventional transformer oil For recommendations regarding specific procedures, please contact Soltex, Inc.

Fluid Storage and Drum Handling:

When drums of insulating oils or additives are to be stored for a long period of time, store them in a dry, heated building. Outdoors, drums should be stored horizontally, with the bungs below the internal oil level. A drip pan or curb around the storage area should be used to contain any fluid from a ruptured or leaking container.

Sometimes, it is necessary to heat the drum before emptying it. This can be done in a warm room, or an oven or with electric drum or pail heaters. Open flames should never be used to warm drums. Before heating a drum, at least one of the bung plugs must be loosened to vent air pressure.

Equipment to use with Soltex Inhibit

The same equipment can be used for handling and processing Soltex Inhibit as is used for conventional transformer oil. Although dedicated processing equipment is best, no foaming or adverse reactions will be experienced if equipment is shared between these oils.

ADDING SOLTEX INHIBIT INTO EQUIPMENT

Soltex Inhibit can be added directly to de-energized equipment without premixing. Soltex Inhibit has a high dielectric strength and is very dry. Therefore, it can be added directly into a transformer via pump or by pouring the correct amount, and the transformer then re-energized. The circulation of transformer oil via convection or pumps will thoroughly mix the two fluids.

Soltex Inhibit should be added to 40 times its volume of transformer oil. Therefore, 5 gallons of Soltex Inhibit will treat 200 gallons of transformer oil. 55 gallons of Soltex Inhibit will treat 2200 gallons of transformer oil.

Transformer oil that has been properly treated with Soltex Inhibit will contain 0.30% phenolic antioxidant after the two fluids have had time to mix.

MAINTENANCE OF SOLTEX INHIBIT IN EQUIPMENT

Maintenance Schedules

Periodic maintenance testing on transformers treated with Soltex Inhibit should be performed on the same schedule as used for other equipment in a similar application. Refer to ASTM Standard Method D923 for the correct methods of sampling fluid from transformers and other electrical equipment.

Dissolved Gas Analysis

Solid and liquid insulation decompose when exposed to high temperatures. The types of gases produced in this decomposition depend upon the temperatures that are experienced. Analysis of the gases that are dissolved in the insulating oil can help the equipment operator detect and identify problems in the equipment. Hot spots in a transformer's windings, for example, produce different gases than arcing from a loose internal connection. The analysis of dissolved gases in Alpha and Beta Fluid uses the same procedures that are used with conventional mineral oil.

The application is described in ANSI-IEEE Guide C57.104, "Guide for the Detection and Determination of Generated Gases in Oil-Immersed Transformers and Their Relation to the Serviceability of the Equipment". Use C57.104 with transformers that have been treated with Soltex Inhibit. It is important to note that dissolved gas analysis provides only guidelines; it is only able to provide advice with respect to transformer problems and diagnostic direction.

Processing Transformer Oil That Contains Soltex Inhibit

Transformer Oil that has been treated with Soltex Inhibit can be reconditioned in the same manner as conventional transformer oil. This process cleans an oil that has been oxidized or contaminated with water, arc decomposition products or other matters.

Water can be removed from insulating oils with a centrifuge, vacuum dehydrators or moisture absorbing filters. Particulate matter may be removed by filtration through a filter with a small pore size (0.5 micron). For specific recommendations regarding reclamation processes for hydrocarbon-based dielectric fluids, consult IEEE Standard 637-1985, "Guide for Reclamation of Insulating Oil and Criteria for Its Use".

Spill Control Information

If a spill of any fluid occurs on land, contain the spilled material with dikes of earth, sand or commercially available spill control pillows. Scoop up excess oil and dispose of it properly. (Put the saturated pillows or sand into drums and have them taken away by a firm licensed to dispose of Toxicity

Soltex Inhibit is virtually non-toxic. It is neither mutagenic nor carcinogenic. Testing effects indicate that it poses little risk to personnel when handled with normal handling procedures. LD_{50} values are over 40 grams per kilogram of bodyweight.

Skin contact testing has shown that Soltex Inhibit has little effect on intact or abraded skin. Some people experience a slight allergic irritation to oils, which makes their skin redden.

Inhalation of oil mist can irritate your lungs. We advise you to take conventional industry precautions against inhalation of mist or vapors, just as you would be with any oil product.

Spills of Soltex Inhibit Fluid fluid are not required to be reported to CERCLA.

A spill of any oil on water should be contained with floating dikes and removed with oil-skimmers and wringing equipment. If enough oil is spilled that is visible on the surface of a navigable waterway, the U.S. Coast Guard must be notified. Carbon- ingesting microbes can help to speed the cleaning of an oil spill site. To report a spill, call the National Response Center (a Federally funded office) at 1-800-424- 8802.

Conclusion:

- Soltex Inhibit is a concentrated oxidation inhibitor mixture for use in transformers.
- Soltex Inhibit can be added in the field to raise the oxidation inhibitor concentration. It saves time and money.
- Soltex Inhibit can raise the concentration of inhibitors from 0.0% to 0.30% in one treatment.
- Use Soltex Inhibit at a 1:40 ratio with transformer oil.
- Soltex Inhibit exceeds IEEE standards for electrical and fire safety.

Reference:

1. **ASTM Standard Specification D3487 "Standard Specification for Electrical Insulating Oil of Mineral Origin", American Society for Testing and Materials**
2. **"C57.106 Guide for Acceptance and Maintenance of Insulating Oil in Equipment" IEE**

Soltex makes no representations regarding the suitability of any product for a given application. Warranties are limited to product characteristics only. Product characteristics may change without notice.

Safety Data Sheet (SDS)

1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifier
Material Name: Alpha-6 Fluid. CAS No: 68956-68-3.

1.2 Relevant identified uses of the substance or mixture and uses advised against Product Use: Dielectric heat transfer fluid.
Uses advised against: None.

1.3 Details of the supplier of the substance or mixture Company:
Soltex, Inc.
4 Waterway Square Place Suite 275
The Woodlands, TX 77380
Telephone: 281-587-0900
Emergency Telephone:
Email:

2. Hazards Identification

2.1 Classification of the substance or mixture
Regulation (EC) No 1272/2008 (CLP): Not classified.
67/548/EEC or 1999/45/EC: Not classified as dangerous under EC criteria.

2.2 Label elements
Regulation (EC) No 1272/2008 (CLP): No symbol or signal word. Directive 1999/45/EC, 67/548/EEC: No symbols or phrases are required.

2.3 **Other hazards**
None.

3. Composition/Information on Ingredients

3.1 **Substance**
CAS No.: 68037-01-4.
Description: Synthetic hydrocarbon, Poly Alpha Olefin (PAO)

4. First Aid Measures

4.1 **Description of first aid measures**
Inhalation: Unlikely to occur due to the low vapor pressure of the substance. Skin: Wash with soap and water. Obtain medical attention if irritation develops. Eyes: Irrigate with copious amounts of water. Obtain medical attention if irritation develops.
Ingestion: Do not induce vomiting, obtain medical attention.

4.2 **Most important symptoms and effects, both acute and delayed No adverse effects expected.**

4.3 **Indication of any immediate medical attention and special treatment needed No special treatment required.**

5. Fire Fighting Measures

5.1 **Extinguishing media**
Carbon dioxide, dry powder, foam or water fog. Do not use water jets.

5.2 **Special hazards arising from the substance or mixture None.**

5.3 **Advice for fire fighters**
Self-contained breathing apparatus may be required.

6. Accidental Release Measures

6.1 **Personal precautions, protective equipment and emergency procedures Spilt product constitutes a slip hazard. Avoid contact with skin and eyes.**

6.2 **Environmental precautions**
Do not contaminate any lakes, streams, ponds, groundwater or soil. Avoid flushing into drains. In the event of a large spillage contains products as thoroughly as possible and dispose of in accordance with local regulations.

6.3 **Methods and material for containment and cleaning up Soak up spilt material with absorbent granules for disposal.**

7. Handling and Storage

7.1 **Precautions for safe handling**
Avoid eye and prolonged skin contact.

7.2 **Conditions for safe storage, including any incompatibilities No special precautions required.**

7.3 **Specific end use(s)**
Exposure to air should be minimized. Opened containers should be properly resealed and stored away from the elements.

8. Exposure Controls/ Personal Protection

8.1 Control parameters
No relevant control parameters.

8.2 Exposure controls
Eye washes should be available for emergency use. Respiratory protection: None required.
Skin protection: Wear coveralls.
Hand protection: Wash hands after use. For prolonged or repeated skin contact, gloves are recommended.
Eye protection: If splashes are likely to occur wear safety glasses.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties Appearance: clear liquid.
Odor: None.
pH: Not applicable.
Freezing point: -43°C.
Initial boiling point and boiling range: >300°C. Flash point: 235°C (COC open cup).
Flammability (solid, gas): Nonflammable.
Upper/lower flammability or explosive limits: Data not available. Vapor pressure: Data not available.
Vapor density: Not applicable. Relative density: 0.81 at 20°C.
Water solubility: 1mg/l.
Partition coefficient: Data not available.
Auto-ignition temperature: No auto-ignition expected. Decomposition temperature: Data not available.
Kinematic Viscosity: 6.0 cSt @ 40°C. Explosive properties: Non-explosive.
Oxidizing properties: Non-oxidizing.

9.2 **Other information Not applicable.**

10. Stability and Reactivity

10.1 **Reactivity**
Product is stable under normal conditions of use.

10.2 **Chemical stability**
Product is stable under normal conditions of use.

10.3 **Possibility of hazardous reactions Data is not available.**

10.4 Conditions to avoid.
Avoid temperatures >200°C.

10.5 Incompatible materials Strong oxidizing agents.

10.6 Hazardous decomposition products None.

11. Toxicological Information

11.1 Information on toxicological effects
Likely routes of exposure: Skin and eyes are the most likely routes for exposure.
Accidental ingestion may occur. Inhalation is not expected to be a relevant route of exposure. Products are non-toxic.

Acute oral toxicity: Low toxicity, synthetic paraffin oil. Acute dermal toxicity: Low toxicity.
Acute inhalation toxicity: Low volatility makes inhalation unlikely. Skin corrosion/irritation: Not irritating.
Eye corrosion/irritation: Not irritating. Respiratory or skin sensitization: Not sensitizing.
Aspiration hazard: Not considered an aspiration hazard.
Carcinogenicity/mutagenicity: Not considered a mutagenic hazard or carcinogen.

When used and/or disposed of as indicated no adverse environmental effects are foreseen. Ecotoxicological effects based on knowledge of similar substances.

12. Ecological Information

12.1 Toxicity
This substance is not considered to pose a hazard to aquatic organisms.

12.2 Persistence and degradability
Readily biodegradable, OECD 301F, >80% after 28 days.

12.3 Bioaccumulative potential
No potential for bioaccumulation.

12.4 Mobility in soil
Products have low mobility in soil.

12.5 Results of PBT and vPvB assessment
The product does not meet criteria for toxicity which require further assessment. It is not considered PBT or vPvB.

12.6 Other adverse effects
No other adverse effects envisaged.

13. Disposal Considerations

13.1 Waste treatment methods.

Product and packaging must be disposed of in accordance with local and national regulations. Maybe incinerated. Unused products may be returned for reclamation.

Not classified as hazardous under air (ICAO/IATA), sea (IMDG), road (ADR) or rail (RID) regulations.

14. Transport Information

14.1 UN number (Harmonized Transport Code) 2710194545

14.2 UN proper shipping name Insulating or Transformer Oils.

14.3 Transport hazard class Not relevant.

14.4 Packing group Not relevant.

14.5 Environmental hazards Not relevant.

14.6 Special precautions for users None.

15. Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture. This product is exempt from REACH registration.

15.2 Chemical safety assessment
A chemical safety assessment has not been carried out for this product.

Compiled according to regulation 1907/EC/2006.

16. Other Information

16.1 Changes from last issue: Original
Version 0

The information provided in this Safety Data Sheet is correct to our best knowledge, information and belief at the date of its publication. It is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not be construed as guaranteeing any specific property of the product. Contact Soltex, Inc. for more information.